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In order to evaluate the safety of the new synthetic opioids, alfentanil and sufentanil, in neurosurgical patients, Marx et al. administered sufentanil 1 microg/kg i.v., alfentanil 50 microg/kg i.v. followed by an infusion of 1 microg/kg/min, or fentanyl 5 microg/kg i.v. to 30 patients with supratentorial tumors anesthetized with nitrous oxide (N2O), 60% in O2. Lumbar cerebrospinal fluid pressure (CSFP) and mean arterial pressure (MAP) responses were recorded for 10 min thereafter, while ventilation was held constant [mean PaCO2 = 36.1 +/- 1.0 mm Hg (SEM)]. There was no change in CSFP after fentanyl. In contrast, both sufentanil and alfentanil caused increases in CSFP, equal to 89 +/- 31 % SE ($p < 0.05$) and 22 +/- 5% ($p < 0.05$), respectively. MAP decreased after the administration of each opioid. Peak decreases in cerebral perfusion pressure (MAP - CSFP) were 14 +/- 3% after fentanyl, 25 +/- 5% after sufentanil and 37 +/- 3% after alfentanil. It is concluded that because sufentanil increased CSFP in patients who have brain tumors, it also may be contraindicated in other neurosurgical patients at risk for intracranial hypertension. Alfentanil may share this propensity since CSFP increased despite a profound reduction in MAP. Among the three opioids evaluated, only fentanyl appears to be appropriate for supplementing N2O-2 anesthesia in patients who have compromised intracranial compliance [1)].

1)
Marx W, Shah N, Long C, Arbit E, Galicich J, Mascott C, Mallya K, Bedford R. Sufentanil, alfentanil, and fentanyl: impact on cerebrospinal fluid pressure in patients with brain tumors. J Neurosurg Anesthesiol. 1989 Mar;1(1):3-7. PMID: 15815232.